

ABSTRACT

The plasma processing apparatus includes: a processing container 11 having a holding stage 13 that holds a substrate 12 to be processed; a micro-wave transmission window 17 provided on or above the processing container, opposite to the substrate to be processed placed on the holding stage; a micro-wave antenna 20 provided above the processing container correspondingly to the micro-wave transmission window for supplying a micro-wave into the processing container; and a micro-wave electric power supplying source 32 connected to the micro-wave antenna. The plasma processing apparatus further includes an electric-field measuring unit 25, 26 that measures electric field strength of the micro-wave supplied by the micro-wave antenna, and a controlling unit 32a, 50A that controls the micro-wave electric power supplying source based on the electric field strength measured by the electric-field measuring unit. This enables a stable substrate process.